**Genetics, DNA and RNA! (Part 1)**

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What IS genetics?
	1. Genetics is the study of how we \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Terms to know!
	1. **Chromosome:** a long strand of \_\_\_\_\_\_\_\_\_\_\_\_\_ that contains many \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	2. **Gene:** a specific location on a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that codes for a specific \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (Ex: ear pits, hairy knuckles, etc)
	3. **Allele:** different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (Ex: have ear pits, don’t have ear pits)
	4. **Autosome:** a chromosome that controls all \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ traits.
	5. **Sex Chromosome:** the \_\_\_\_\_\_ and \_\_\_\_\_\_ chromosomes. They determine \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (boy or girl).
	6. **Dominant:** a version of an allele that is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ even if only \_\_\_\_\_\_\_\_\_\_\_\_\_\_ gene is present. Represented by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	7. **Recessive:** a version of an allele that is only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ if \_\_\_\_\_\_\_\_\_\_\_\_\_\_ genes are recessive. Represented by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	8. **Genotype:** The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a person has.
	9. **Phenotype:** The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ expression of a trait.
		1. **Ex:** having the dominant trait of non-red hair, or having the recessive trait of red hair.
	10. **Punnett Square:** used to determine the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ outcome of a cross between parents.
	11. **Gene-Chromosome Theory:** this is the idea that on the SAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in every person, EVERY \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is in the same location.
3. **\*\*\*You have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ genes for every one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.\*\*\***

We have \_\_\_\_\_\_ chromosomes, but we think about them as \_\_\_\_\_\_\_ pairs. For pair #11, you get one from \_\_\_\_\_\_\_\_\_\_\_\_\_ and one from \_\_\_\_\_\_\_\_\_\_\_\_\_\_. Each PAIR controls the same traits.



1. DNA Nitty Gritty!
	1. Functions of DNA
		1. Controls ALL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ production.
		2. Controls all \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ traits (Mostly by making certain proteins! For example, brown hair protein is different than blonde hair proteins.)
		3. Controls some \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ traits?? Nature vs. Nurture?? This means, how much of your personality is controlled by your genes and how much is formed by your life experiences?? We know that both matter, but no one can really say how much each plays a role!



* 1. Monomer of DNA is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
		1. A nucleotide contains one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ base.
	2. Basic structure of DNA is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	3. The “backbone” or sides are made of repeating \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	4. The middle “rungs” (as in a ladder) are the nitrogenous \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. These are the important parts of DNA!! \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ always matches with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ always matches with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. A dumb sentence to help is “All Thieves Get Caught”.



1. DNA Replication
	1. DNA replicates during \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	2. First, the original strand of DNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	3. Next, each open \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ binds to a new complimentary \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This means if there was a T (thymine) open, and nucleotide with A (adenine) will bind on.
	4. The end result is two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ strands of DNA. Each new strand is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the original and half \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Genetic Engineering
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can be cut out of one organism and be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into another. This creates man-made combinations of traits!!
	2. One practical use is using bacteria to create insulin!
3. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for producing human insulin is \_\_\_\_\_\_\_\_\_\_\_\_ from a human \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. The \_\_\_\_\_\_\_\_\_\_ of a bacteria (called a plasmid) is cut and the human insulin \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is inserted.
5. The bacteria \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and pass along the human insulin information.
6. The bacteria cells produce human insulin which is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for human use!

